Central Pollution Control Board
WM - II Division, Delhi

Sub: Minutes of the Tenth Meeting of the Technical Expert Committee for "Evaluation of proposal for utilization of the hazardous and other wastes under Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016".

1. Tenth meeting of the Technical Expert Committee on "Evaluation of proposal for utilization of the hazardous and other wastes under Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016" was held at CPCB, Delhi on 12.03.2018. List of the participants is enclosed at ***Annexure A***.

2. Shri Bharat K Sharma, Additional Director & Divisional Head, WM-II, welcomed the members and invitees of the Committee. He made a brief presentation on the Standard Operating Procedure followed for processing applications received under Rule 9 of the HOWM Rules, 2016 and terms of references of TEC. Current status of the applications received by CPCB for grant of approval for utilization of hazardous waste was also presented.

3. TEC reviewed draft Standard Operating Procedures (SoPs) & Check list of Minimal Requisite facilities for utilization of hazardous waste, prepared by WM-II Div., CPCB, based on trial study conducted in accordance with the trial run monitoring protocol. Details of the same and recommendations of the TEC are as below:

Sl. No.	Agenda	TEC Recommendation
1.	Standard Operating Procedure (SOP) for Utilization of tarry residue generated from gasifier units for production of creosote oils & coal tar pitch	SoP & Checklist of Minimal Requisite Facilities for the said utilization, as recommended by TEC, after incorporating suggestions, is given at ***Annexure – I***

The committee also discussed recommendations made during joint meeting of officials of Gujarat PCB and Regional Directorate, CPCB, Vadodara, (held on 20/1/2018 at Gandhinagar) about reconsidering the case of utilization of spent aluminium chloride to produce Aluminium Hydroxide Chloride/ Poly Aluminum Chloride for use in Pulp & Paper industry. The trial utilization was already carried out in this regard. Upon reviewing the same, the TEC recommended SOP & Checklist of Minimal Requisite Facilities for utilization of spent aluminium chloride (generated during manufacturing of Meta Phenoxy benzaldehyde, CPC green and 2. 4, 6- Trimethyl benzoyl chloride) to produce Aluminum Hydroxide Chloride/ Poly Aluminum Chloride for use in Pulp & Paper industry and ETP. The said SOP & Checklist is given at ***Annexure – II.***

4. The following applicants were requested to make technical presentation before the committee:

(i) M/s Krishnaraj Fertichem Pvt. Ltd., Plot No.: 5&6, Gozariya GIDC, Gozariya, District: Mehsana - 382825, Gujarat.

(ii) M/s Mangalam Alloys Ltd., (Unit III) Plot No. 3246-47, Survey No. 96/P. Adarsh Industrial Park, Phase -III GIDC Chatral, Taluka: Kalol, District: Gandhinagar.

(iii) M/s Vitrag Chemicals, Plot No. C-1-B/81,100 Shed, GIDC, Vapi, Taluka: Pardi, District: Valsad.

(iv) M/s Synergy Multichem Pvt. Ltd., 599-6008, Village: Dudhwada, Taluka: Padra, District: Vadodara.

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(v) M/s Lionel Resources Pvt. Ltd., Plot No.14, GIDC, Kuvadava, District: Rajkot, Gujarat.

(vi) M/s Hemani Industries Ltd., Plot No. 180/1/240 Shed Area, GIDC, Vapi-396195, Gujarat.

(vii) M/s Ashima Limited, Texcellence Complex, Opp.Anupam Cinema, Khokhra, Ahmedabad – 380 021.

(viii) M/s Geeta Chemicals, Plot No. 4906/B,C,D, GIDC, Ankleshwar, Dist.:Bharuch, Gujarat.

(ix) M/s Shankus Biosciences Pvt. Ltd., Survey No. 747, Nr. Ratnamani, Village: Indrad, Taluka Kadi, District: Mehsana

(x) M/s Aarti Industries (organic Division), Plot No. 801/23, Phase-III, GIDC, Vapi, Gujarat-396195.

(xi) M/s Chirpal Industries Limited, Plot No. 174-176, Sajipur- Gopalpur, Pirana Road, Piplej, Ahmedabad, Gujarat-382405.

The applicant listed at (iii) and (v) above were not present in the meeting. The details of the proposals alongwith the recommendations of the committee are given in **Annexure-III**.

4. It was also suggested that Gujarat PCB may ask representative of industrial association to make technical presentation in the next TEC meeting about scope of utilization of spent acid generated from various Dye & Dye intermediate industries in ETP. The same may enable CPCB in developing one single SOP for such utilization instead of going through multiple trial runs on case to case basis.

5. The meeting ended with vote of thanks to the Chair.

R. K. Singh

Annexure A

CENTRAL POLLUTION CONTROL BOARD
DELHI- 110 032

Date: March 12, 2018

Venue: Training Hall, Ground Floor, Parivesh Bhawan, CPCB, Delhi- 110 032

List of Participants

Sl. No	Name	Designation and Organization	Member of the Committee / Invitee
1.	Dr. R.K. Singh	Retired Scientist 'F', Bureau of Indian Standard	Chairperson
2.	Prof. Rajeev Gupta	Department of Chemistry, University of Delhi, Delhi	Member
3.	Prof. Kamal Kishore Pant	Department of Chemical engineering, Indian Institute of Technology, Delhi	Member
4.	Sh. D. M. Thaker	Environmental Engineer, Hazardous waste management, Gujarat Pollution Control Board	Member
5.	Dr. Akhil Kumar Swar	Senior Environmental Engineer, Odisha Pollution Control Board	Member
6.	Sh. B. Vinod Babu	Additional Director & Head, WM-I Div, CPCB, Delhi	Member
7.	Sh Dinabandu Gouda	Additional Director, IPC-I Div, CPCB, Delhi	Member
8.	Sh. Bharat K Sharma	Additional Director & Head, WM-II Div, CPCB, Delhi	Member Convener
9.	Ms. P K Selvi	Scientist 'D', WM-II Div, CPCB, Delhi	Invitee
10.	Ms. Deepti Kapil	Scientist 'C' , WM-II Div. CPCB, Delhi	Invitee
11.	Ms. Vineeta	Senior Scientific Assistant, WM-II Div, CPCB, Delhi	Invitee
12.	Ms. Rupali Gupta	Junior Research Fellow, WM-II Div, CPCB, Delhi	Invitee
13.	Sh. Varun Prabhu	Junior Research Fellow, WM-II Div, CPCB, Delhi	Invitee

Annexure III

Recommendation of the committee for approval of proposals under Rule 9 of the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016.

Sl. No.	Name of the Industry	HW as Raw Material	Product	Process	Recommendations
1.	M/s Krishnaraj Fertichem Pvt. Ltd., Plot No.: 5&6, Gozariya GIDC, Gozariya, Dist.: Mehsana - 382825, Gujarat.	Ammonium Bi-Carbonate: C1 of schedule II of HOWM Rules, 2016) generated from dye industry i.e. copper Phthalocyanine blue.	Zinc Carbonate, Copper Carbonate, Manganese Carbonate, Magnesium Carbonate and Ferrous Carbonate to be used in industrial application; Ammonium Sulphate (by product)	Ammonium bicarbonate is utilized for the production of metallic carbonates (viz., zinc carbonate/copper carbonate/magnesium carbonate/ manganese carbonate) and ammonium sulphate (by product). Metallic sulphate and ammonium bi carbonate are added in the precipitation tank on maintaining pH 7. The precipitated metallic carbonate is transferred to centrifuge followed by tray drier and the dried final product is packed. The supernatant from the centrifuge is sent to the evaporator for recovery of ammonium sulphate as by-product.	The committee noted that to produce various products, utilization process is similar. It was recommended that trial run shall be conducted for for manufacturing of zinc carbonate and copper carbonate, which was agreed by the applicant. The trial monitoring study shall be conducted including the following; i. Analysis of hazardous waste, products and by products w.r.t. thylocyanine, nitro benzene, copper, chlorides and TOC. ii. Source emission in the reaction vessel, rotary drier, and evaporator shall be monitored for (ammonia, TOC, Heavy Metals (Sb+As+Pb+Co+Cr+Cu+Mn+Ni+V+their compounds) and PM). iii. Fugitive emissions shall also be monitored for (Ammonia & TOC) in the work zone area. iv. Requirement of disposal of mother liquor after some cycles of recycling be assessed. The trial run may be granted for 05 batches for each of the said 02 metallic carbonates. Further, the committee did not approve the end use of the by-product (i.e ammonium sulphate) for agriculture purpose. The unit shall submit end use details of ammonium sulphate in industrial applications.
2.	M/s Mangalam Alloys Ltd., (Unit III) Plot No. 3246-47, Survey No. 96/P. Adarsh Industrial	ETP Sludge: 35.3 of schedule I of HOWM Rules, 2016) generated form Pickling Process in	Gypsum extracted from ETP Sludge (Paver Block in brick lining) and	The utilization process involves addition of ETP sludge, water and H_2SO_4 in the reaction vessel with continuous stirring for 6 hours, followed by filtration through filter press where filter cake (Gypsum) is collected. The	The committee observed that the applicant does not have definite utilization/management of filtrate generated during the utilization process. Further, the filter cake (Gypsum) derived from using ETP sludge has significant concentration of fluoride, Nickel,

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Sl. No.	Name of the Industry	HW as Raw Material	Product	Process	Recommendations
	Park, Phase -III GIDC Chatral, Ta.: Kalol, Dist.: Gandhinagar.	steel industry.	Red Oxide (pigment in paint industry)	filter cake is used as a binder in paver block manufacturing. The liquid from the filtration tank is mixed with $NaNO_2$ and NaOH followed by passing through filter press. The filter cake i.e. Red oxide is used as a pigment in paint industries. The filtrate is proposed to be further processed so as to produce pigment.	Chromium etc. Accordingly, it was recommended that the applicant shall submit revised proposal with environmentally sound management of the said filtrate. The applicant shall also include the following in its revised proposal: i. Minimization of leachable fluoride content in the ETP sludge (i.e hazardous waste). ii. Management of the nickel and chromium content in Gypsum (to be used in paver blocks) derived from ETP sludge; iii. TCLP analysis for Ni, Cr, F & Mn shall be carried out in the Gypsum and Paver block, and; iv. The paver block produced using the said Gypsum shall meet the specifications prescribed in BIS standard, if available. The revised proposal including the above information shall be submitted by the applicant within a period of two months, as agreed by the applicant. Upon receipt of the same, the applicant may be invited in the subsequent TEC meeting.
3.	M/s Vitrag Chemicals, Plot No. C-1-B/81,100 Shed, GIDC, Vapi, Ta.: Pardi, Dist.: Valsad.	Spent sodium hypochlorite and caustic: C15 of schedule II of HOWM Rules, 2016) generated from dye & dye intermediate (generated from the chlorine scrubber of meta di Chloro benzene manufacturing process & 1,4 Dioxane&2-Methyl-1, 3-Dioxolane)	Sodium hypochlorite to be used in ETP, as oxidizing agent and textile industry etc.	The utilization process involves addition of spent sodium hypochlorite solution and caustic solution in the reaction tank with the addition of ice and chlorine; pH is maintained by adding alkaline solution from the scrubber. After complete reaction the final product i.e. sodium hypochlorite is formed.	The applicant was not present for making technical presentation on proposed utilization process. However, the committee evaluated the proposal and observed that the applicant shall also submit analysis report of the spent sodium hypochlorite and the product (i.e sodium hypochlorite) in terms of mg/l w.r.t. the raw materials used in the hazardous waste generation process. It was recommended that the applicant may be invited to make technical presentation about utilization process in the next TEC with the above analysis report.

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Sl. No.	Name of the Industry	HW as Raw Material	Product	Process	Recommendations
4.	M/s Synergy multichem Pvt. Ltd., 599-6008, Village: Dudhwada, Ta.: Padra, Dist.: Vadodara.	Spent $AlCl_3$ (Cat. D2 under schedule II of HOWM Rules, 2016)	Poly Aluminium Chloride is proposed to the used in Effluent treatment plant (as coagulant) and pulp & paper industry (sizing agent)	The utilisation process involves charging of Spent Aluminum Chloride into the reactor and addition of Alumina hydrate. The temperature in the reactor is raised upto 160 ^{0}C by providing steam. The reaction mixture is cooled down to 40-45 ^{0}C and the reacted mass is filtered through filter press to get Poly Aluminum Chloride. The solid cake (i.e. residue) obtained during filtration is sent to Common TSDF.	The committee observed that the unit proposes to utilise Spent $AlCl_3$ generated during manufacturing of Meta Phenoxy benzaldehyde only. The utilisation process is similar to the SOP discussed in this meeting except that heating of the reaction tank and cooling of the reacted media are carried out due to addition of Alumina hydrate instead of aluminum hydroxide. The use of aluminium hydroxide is exothermic and thus do not require to heat the reaction mass. In view of the above, the committee recommended the proposal and suggested to incorporate the use of Alumina Hydrate also in the SOP along with scope of heating and cooling, as above. The SOP, incorporating the same, for utilization of spent aluminium chloride to produce Aluminum Hydroxide Chloride/ Poly Aluminum Chloride is given at Annexure II.
5.	M/s Lionel Resources Pvt. Ltd., Plot No.14, GIDC, Kuvadava, Dist.: Rajkot, Gujarat.	Plastic waste category: 22.2 of schedule I of HOWM Rules, 2016) generated from used paper waste.	Pyrolysis oil, carbon black and charcoal	The utilisation process involves de-polymerization of the plastic in absence of oxygen. De-polymerization of plastic produces plastic derived fuel oil and carbon black as end products. De-polymerization takes place at 375 to 425 ^{0}C in presence of Catalyst.	The applicant was not present for making technical presentation on proposed utilization process. After evaluating the utilization proposal, the committee recommended for submission of following information within 30 days: i. Process detail for utilization of Plastic waste including list of all the raw materials/ chemicals used in such process along with chemical reactions. ii. Working principle of each of the plant & machineries alongwith details of the operational parameters such as feeding mechanism, temperature, residence time, release of process emission, process discharges as applicable, pollution control device, stack height, etc. iii. Characteristics of the Plastic waste and product (Fuel oil and carbon black) w.r.t. total concentration of heavy metals, halogens and AOx. TCLP test for the said parameters shall also be carried out for carbon black.

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Sl. No.	Name of the Industry	HW as Raw Material	Product	Process	Recommendations
					iv. The product i.e. pyrolysis oil shall be analysed and compare with the BIS standard for fuel (re-refined oil) w.r.t the end use. Upon submission of the above information/documents, the proponent may be invited for making technical presentation in the next meeting.
6.	M/s Hemani Industries Ltd., Plot No. 180/1/240 Shed Area, GIDC, Vapi-396195, Gujarat.	Spent sulphuric acid category: 26.3 of schedule I of HOWM Rules, 2016) generated dye & dye intermediate industries.	Magnesium sulphate and magnesium hydroxide to be used in tanning explosive, printing, dyes manufacturing, paper industry, porcelain manufacturing.	The utilization process involves addition of spent sulphuric acid and magnesium oxide in the reactor at 75-80 ^{0}C and at atmospheric pressure. The reacted mass is passed through filter press followed by crystallizer and centrifuge to produce the final product Magnesium sulphate. To manufacture magnesium hydroxide, sodium hydroxide is added to the aforesaid reacted mass from the reactor to intermediate tank. Also, sodium sulphate is formed as a by-product in this process.	The committee recommended that trial run shall be conducted for 03 days with and without utilizing spent acid. The following may be incorporated in the trial study; i. Analysis of hazardous waste w.r.t. pH, TOC, moisture content, chloride and heavy metals. ii. Source emission in the stack attached to the reaction vessel, scrubber shall be monitored for PM and H_2SO_4 mist. iii. Fugitive emissions shall also be monitored for (acid mist and PM_{10}) in the work zone area. iv. Analysis of products w.r.t. TOC, heavy metals and moisture. v. Requirement of disposal of mother liquor after some cycles of recycling be assessed. The committee did not approve the end use of the products as soil conditioner and fertilizer in agriculture.
7.	M/s Ashima Limited,. Texcellence Complex, Opp.Anupam Cinema, Khokhra, Ahmedabad – 380 021.	Spent sulphuric acid category: 26.3 of schedule I of HOWM Rules, 2016) generated from used dye industry.	In ETP as neutralizing agent	The spent acid is used in the effluent treatment plant as neutraliser.	The committee recommended that a trial study be conducted wherein performance of ETP in terms of BOD, COD, phenolic compounds and other parameters as stipulated in the Consent to Operate issued by the concerned SPCB, be assessed. Such trial study shall be carried out with and without utilising the spent acid for a period of 03 days.
8.	M/s Geeta Chemicals, Plot No.	Spent Hydrochloride acid category: 26.3	Hydrochloric acid to be used	In the said utilization process spent hydrochloric acid is passed through a resin	The committee observed that the proponent could not justify reasons for colour in the hazardous waste (i.e

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Sl. No.	Name of the Industry	HW as Raw Material	Product	Process	Recommendations
	4906/B,C,D, GIDC, Ankleshwar, Dist.:Bharuch, Gujarat.	of schedule I of HOWM Rules, 2016) generated from manufacturing of toluene di-isocyanate, chlorinated paraffin and sodium hypochlorite.	in dyes/ steel and Pharma industries	tower (i.e. Ion exchange Resin) for colour removal and pure HCl is produced.	spent HCl) and principle of the technique used for removal of color and other contaminants in the said utilization process. The committee, therefore, rejected the proposal. However, the applicant may submit a fresh application with revised proposal once they study the source wise generation of spent HCl w.r.t its characteristics like colors and other contamination etc., principle of the technique used for removal of color and other contaminants in the said utilization process.
9.	M/s Shankus Biosciences Pvt. Ltd., Survey No. 747, Nr. Ratnamani, Village: Indrad, Ta. Kadi, Dist: Mehsana	Spent Hydrochloride acid category: 26.3 of schedule I of HOWM Rules, 2016) generated from dye and dye intermediate industries.	Di calcium phosphate for use in cattle feed/poultry feed.	The utilization process involves addition of rock phosphate and spent hydrochloric acid in the reactor and maintaining the pH 3 with continuous stirring for 4 hours. The reacted mass is added with lime stone to produce di calcium phosphate slurry. The DCP slurry is passed through centrifuge followed by rotary drier to product the final product	The committee observed that the impurities (heavy metals and organic compounds) present in the spent hydrochloric acid would be transferred to the product which may impact cattle/poultry. After detailed deliberation with the applicant, the committee recommended that the proposal shall be considered upon submission of: i. Reference document/technical documents/test results suggesting safe limit of relevant organic compounds and heavy metals in cattle/poultry feed. Till such supporting document is made available, the committee recommends rejection of the utilization proposal.
10.	M/s Aarti Industries (organic Division), Plot No. 801/23, Phase-III, GIDC, Vapi, Gujarat-396195	Diluted Sulphuric Acid: 26.3 of schedule I of HOWM Rules, 2016) generated from used dye and dye intermediate industry.	Conc. Sulphuric Acid (70%) used in manufacturing of single super phosphate	The utilization process involves concentration of 40% or 20% of spent sulphuric acid into 70 % by azeotropic distillation. The concentrated sulphuric acid is utilized for manufacturing single super phosphate.	After detailed deliberation with the applicant on the principle of azeotropic distillation of the spent acid, the committee recommended that trial run may be conducted for a period of 4 days on Spent Acid having 40% concentration. The said trial monitoring study shall include the following; i. IITR Lucknow/ NEERI/ other CSIR labs collected the spent acid sample and go for the analysis related to Eco-toxicity ii. Analysis of hazardous waste (i.e spent acid 40 %), concentrated acid and condensate water

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Sl. No.	Name of the Industry	HW as Raw Material	Product	Process	Recommendations
					w.r.t. 2,6 DCPNA, nitrobenzene, 3 5 DCNB, MNCB, PNCB and TOC. iii. Analysis of product (single super phosphate) w.r.t. TOC and heavy metals in both i.e. with and without utilizing spent acid; iv. Source emission shall be monitored for PM and H_2SO_4 mist; v. Fugitive emissions shall also be monitored for (acid mist and PM_{10}) in the work zone area.
11.	Chirpal Industries Limited, Plot No. 174-176, Sajipur-Gopalpur, Pirana Road, Piplej, Ahmedabad, Gujarat-382405.	Spent sulphuric acid category: 26.3 of schedule I of HOWM Rules, 2016) generated from dye & dye intermediate industry.	Spent acid is used in ETP as neutralizing agent	The spent acid is used in effluent treatment plant as neutralizer.	The committee recommended that a trial study be conducted wherein performance of ETP in terms of BOD, COD, phenolic compounds and other parameters as stipulated in the Consent to Operate issued by the concerned SPCB, be assessed. Such trial study shall be carried out with and without utilising the spent acid for a period of 03 days.

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